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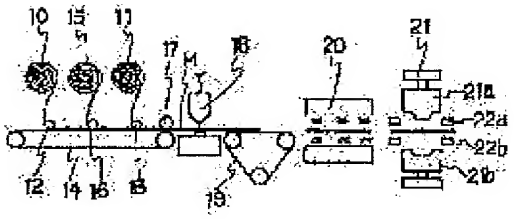
(54) GLASS FIBER PREFORM

(57)Abstract:
PURPOSE: To provide a glass fiber preform having a small variation in glass fiber amount in every part at a low material cost in comparison with a conventional glass fiber preform although a stamped preform method is used.
CONSTITUTION: In the production of a glass fiber preform shaped into a closed- end open-top box 900mm wide, 1200mm long, and 540mm high, the preform has a three-layer structure, in which an inner layer made of glass fiber chopped strand mat 15 is provided in a partially broken state between outer layers made of glass fiber continuous strand mats 10, 11, and has ideal product dimensions.



* NOTICES *

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CLAIMS

[Claim(s)]
[Claim 1]A glass fiber preform, wherein it is a glass fiber preform which has the multilayer structure of three or more layers, an outer layer consists of a glass fiber continuation strand mat and at least one layer of a inner layer consists of glass fiber chopped strand mats.
[Claim 2]A glass fiber preform of claim 1, wherein eyes of a glass fiber continuation strand mat and a glass fiber chopped strand mat are 225 - 600 g/m^2.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application]This invention relates to the glass fiber preform used as a reinforcing member of an FRP Plastic solid.
[0002]
[Description of the Prior Art]As a method of producing the preforming object of the glass fiber conventionally called a glass fiber preform, a direct preform technique and the two methods of the stamp DOPURI form method exist.
[0003]After cutting glass roving to about 2 inches with a direct preform technique, After spraying the mold of specified shape with a liquefied binding material, are the method of drying and with the stamp DOPURI form method. After producing a glass fiber continuation strand mat by fabricating many glass fiber continuation strand comrades to mat state using the organic binder which consists of thermoplastics, it is the method of heating this and carrying out compression molding to specified shape.
[0004]Compared with a direct preform technique, its productive efficiency is good, and since the stamp DOPURI form method can be produced continuously, it is a method for which it was suitable when a glass fiber preform was mass-produced.
[0005]In order to produce a glass fiber preform continuously by the stamp DOPURI form method, Two or more things which rolled round the above glass fiber continuation strand mats to rolled form first are prepared, After piling up pulling out these glass fiber continuation strand mats and judging to predetermined length, by putting into a heating furnace, Since the organic binder which has adhered to the surface of a glass fiber continuation strand mat is softened and this is moved with a mat moving system subsequently to between the punch of a die, and bottom parts, the circumference is inserted with a clamping frame, it carries out [mold clamp] and the method of carrying out compression molding is taken.
[0006]
[Problem(s) to be Solved by the Invention]However, since a comparatively expensive glass fiber continuation strand mat is used, the problem that the rate of the material cost occupied to a glass fiber preform becomes high is among the glass fiber preforms manufactured by the stamp DOPURI form method.
[0007]If the glass fiber preform of ********** used, for example for an organ

bath is produced by the stamp DOPURI form method, Since a glass fiber continuation strand mat is extended especially in an organ bath base part and the amount of glass fibers decreases, even if it uses this as a reinforcing member of an FRP Plastic solid, the intensity of a part with few amounts of glass fibers becomes low.

[0008]In spite of making this invention in view of the above-mentioned situation and applying the stamp DOPURI form method, Compared with the conventional glass fiber preform, material cost is low, and dispersion in the amount of glass fibers in a part aims at providing few glass fiber preforms.

[0009]

[Means for Solving the Problem]That is, a glass fiber preform of this invention is a glass fiber preform which has the multilayer structure of three or more layers, an outer layer consists of a glass fiber continuation strand mat, and at least one layer of a inner layer consists of glass fiber chopped strand mats.

[0010]In this invention, eyes of a glass fiber continuation strand mat and a glass fiber chopped strand mat are characterized by being 225 g/m^2 - 600g[/m] ^{2}.

[0011]By piling up a mat which at least one layer of a inner layer should just be produced from a glass fiber chopped strand mat, for example, has the eyes of 450 g/m^2 in this invention so that it may become four layer systems, When producing a glass fiber preform of thick eyes of 1800 g/m^2, all of the inner layer may be produced from a glass fiber chopped strand mat, but it may produce from a glass fiber chopped strand mat and a glass fiber continuation strand mat.

[0012]

[Function]With the glass fiber chopped strand mat used by this invention. After judging a glass fiber strand to predetermined length, equivalent distribution is made to carry out in the random direction on a flat surface, Subsequently, it fabricates to mat state with the organic binder which consists of thermosetting resin or thermoplastics, Although material cost is low compared with a glass fiber continuation strand mat, since it fractures selectively and shape collapses even if it applies only this to the above-mentioned stamp DOPURI form method, it is impossible to obtain the glass fiber preform of a good product dimension.

[0013]However, in the case of the glass fiber preform of this invention, some glass fiber chopped strand mats fracture with compression molding, but since shape is held by the outer layer which consists of a glass fiber continuation strand mat located so that it may be inserted, a good product dimension is obtained.

[0014]The glass fiber preform of this invention is compared with the glass fiber preform produced only from the conventional glass fiber continuation strand mat, A glass fiber chopped strand mat is not extended at the time of compression molding, but also in the case of **********, in order to tear to pieces and distribute, the cross direction of a mat and dispersion of the part of the amount of glass fibers of the direction of a drawer decrease.

[0015]The reason which limited the eyes of the glass fiber continuation strand mat used in this invention and the glass fiber chopped strand mat to 225 - 600 g/m^2 is an adhesive property with FRP resin has such a superintendent officer's good mat, and low [material cost] moreover.

[0016]
[Example]Hereafter, the glass fiber preform of this invention is explained in detail based on an example.
[0017](EXAMPLE) Drawing 1 is an explanatory view showing one example of the manufacturing process of the glass fiber preform of this invention.
[0018]The glass fiber continuation strand mats 10 and 11 are rolled round by rolled form among the figure.
It is drawn out by the 1st band conveyor 14 via the tension adjustment rollers 12 and 13.
The glass fiber chopped strand mat 15 is also rolled round by rolled form, and it is drawn out by the 1st band conveyor 14 via the tension adjustment roller 16.
[0019]Subsequently, the glass fiber continuation strand mats 10 and 11 and the glass fiber chopped strand 15, It is stuck and piled up with the presser-foot roller 17, and the compound mat M of a three-tiered structure in which the inner layer which consists of the glass fiber chopped strand mat 15 is located between the outer layers which consist of the glass fiber continuation strand mats 10 and 11 by this is produced.
[0020]Then, after this compound mat M stops at a prescribed position and being judged by specified length with the cutting machine 18, It moves into the heating furnace 20 with the mat moving system (not shown) which has a mechanism which grasps those circumferences further, and to which move to the position before the heating furnace 20, and it is made to move on the 2nd band conveyor 19.
[0021]The heating furnace 20 is set as about 300 ** ambient temperature.
By carrying out fixed time maintenance of the compound mat M here, the organic binder adhering to the surface fully becomes soft.

[0022]An end of this heat-treatment will move the compound mat M with a mat moving system (not shown) between the punch 21a of the making machine 21, and the bottom part 21b. Subsequently, when the clamping frames 22a and 22b of the upper and lower sides which have the shape with which the circumference of the punch 21a and the bottom part 21b is equipped move, If it is mold clamp carried out of the making machine 21, and compression molding of the compound mat M is carried out, after the circumference of the compound mat M is inserted, the punch 21a and the bottom part 21b are opened and the compound mat M is taken out after carrying out fixed time lapse, the glass fiber preform of a three-tiered structure will be obtained.
[0023]The glass fiber continuation strand mats 10 and 11 and the glass fiber chopped strand mat 15 which have the eyes of a width of 1500 mm and 450 g/m^2 are used using such a device, By judging in length of 1800 mm and subsequently performing heating and compression molding with the cutting machine 18, after producing the compound mat M as mentioned above, When the glass fiber preform of the core box shape of a closed-end nothing lid which has 900 mm in width, 1200 mm in length, and a 540-mm-high size is produced, between the outer layers which consist of the glass fiber continuation strand mats 10 and 11, The inner layer which consists of the glass fiber chopped strand mat 15 has a three-tiered structure which intervenes in the state where it fractured selectively, and had a

good product dimension.
[0024]In order to investigate dispersion in the amount of glass fibers in each part of the glass fiber preform obtained in this way, when the eyes of each part were measured, it was 1000 - 1300 g/m^2.
[0025]As the glass fiber chopped strand 15, what fabricated the glass fiber strand comrade cut by specified length to mat state using the organic binder which consists of thermosetting resin was used.
[0026](Comparative example) It replaced with the glass fiber chopped strand mat 15 in an example, the glass fiber continuation strand mat which has the eyes of 450 g/m^2 at 1500 mm in width was used, and the glass fiber preform of the same size was produced on the same conditions except [all] it.
[0027]In this way, although the glass fiber preform of the three-tiered structure which consists only of a produced glass fiber continuation strand mat had a good product dimension, when the eyes in each part are measured, it is 600 - 1300 g/m^2.
Compared with the glass fiber preform of an example, it turned out that there is much dispersion in the amount of glass fibers in a part.

[0028]The above-mentioned eyes cut off the prescribed spot of the base part of a glass fiber preform, a short piece lateral portion, and a long piece lateral portion in size of 150x150 mm, and calculate it by weighing the weight.
[0029]
[Effect of the Invention]As mentioned above the glass fiber preform of this invention, In spite of applying the stamp DOPURI form method which can be mass-produced, Since material cost is low compared with the glass fiber preform produced only from the conventional glass fiber continuation strand mat and there is moreover little dispersion in the amount of glass fibers in a part, high intensity will be given to the FRP Plastic solid which uses this as a reinforcing member over the whole.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]It is an explanatory view showing the manufacturing process of the glass fiber preform of this invention.
[Description of Notations]
10, 11 glass fiber continuation strand mat
15 Glass fiber chopped strand mat
18 Cutting machine
20 Heating furnace
21 Making machine

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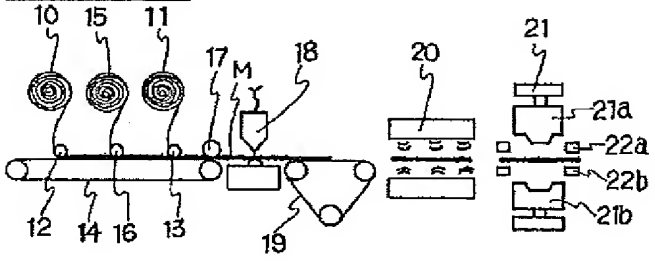
DRAWINGS

[Drawing 1]



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